GIS Systems STONEX:

Innovative tools for
accurate geographic data
field collection

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Mobile GIS for Mapping and recognitions of territorial elements: real time compactness, smoothness and accuracy from metric to centimetric range

STONEX systems are the hands-on answer to the needs to provide the professionals working on the field with integrated and scalable instruments, matching the most advanced GIS technologies existing on the market, significantly amplifying work opportunities.

Professionals as Foresters, Agronomists, Land Surveyors, Civil Protection operators, City Vigilance, Police and multiservice companies that work in territorial environment, easily can:

- Create a mapping project and information assembling to detected ground elements, using raster or vectorial maps, inserting it into a reference system selected from the main existing or created in order to fit their working needs;
- Build, develop and manage customized informative territorial database;
- Catalogue surveyed elements according to their geometric category (points, lines, areas, paths);
- Acquire the positions of the ground elements with diverse accuracy (fast or topographic) according to their working needs;
- Carry out measurements and inspections directly on the field;
- Survey those elements (points, lines, areas and paths) focused on the update of the related database;
- Check in real time the adequacy of the inserted data;
- Store digital photos and documents along with surveyed data.

Endless advantages and opportunities

During the last years professionals working on territorial environment have confirmed their demands to provide instruments more and more adaptable and accurate, but overall user friendly and widely affordable for all sorts of users.

ADVANTAGES:

- Enfranchise the operators from paper supports during the field surveys (topographic file-cards, card-file of previous mappings, technic, thematic, historic, cartographies);

- Existing background navigation or recallable in the field;

- Survey and catalogue ground elements connecting data to existing (DBF) or customized database;

- Capability to use instruments in difficult environmental conditions as dense arboreal coverage;

- Bright display visualization even under strong and direct sunlight exposure;

- Send data in real time from the field to the office through Internet connection by modem;

- Connection to the GPS NW to get differential correction in order to increase the survey accuracy.

OPPORTUNITIES:

- Software applications (GeoGis in the field and GeoGisOffice in the office) user friendly as well from unskilled operators and professionals' point of view;

- Usage flexibilitiy in works that require different accuracies: from metric accuracy for tracking to centimeter accuracy for cadastral positioning of points division;

- Satisfaction of commissioners' requirements by creating customized database all the way compatible with the most diffused territorial systems used in the office;

- Capabilities to get digital pictures in geo-referenced formats, in order to place it on digital cartographic representations.

Solutions and applications for all needs

AGRICULTURE

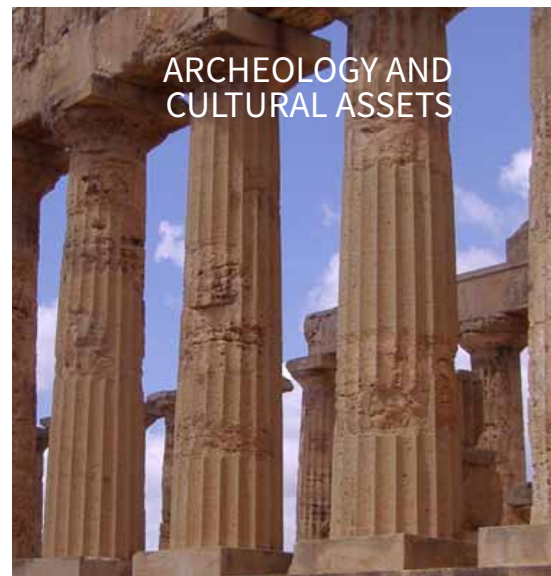FORESTRY

WILDLIFE

ENVIRONMENTAL MONITORING

TRACKING

GEOLOGY

ARCHITECTURE

ARCHEOLOGY AND CULTURAL ASSETS

CRIME SCENES

TRAFFIC ACCIDENTS

STONEX S7 series handheld receivers

STONEX handheld receivers S7 series GPS/GNSS conjugate the latest positioning's technology with the flexibility of a powerful handheld, ideal for data collection.

The STONEX S7 features a fast and efficient GSM/GPRS modem to be used straight in the field, Wi-Fi connection and Bluetooth technology allowing the user a fast and smooth data transfer. Thanks to the internal modem is easy to improve data's accuracy by connecting to the GPS NW.

The products' range offers two different models able to cover all surveying applications.

STONEX S7-D is a GNSS receiver (L1, GPS, GLONASS, SBAS) designed to collect data in fast mode and decimeter accuracy.

STONEX S7-G is an authentic revolution in GNSS receivers field (L1, L2, GPS, GLONASS, SBAS), able to comply with all demands, from GIS to topography.

Both receivers can be equipped with GeoGis, software developed by STONEX.

" The handheld S7 is a compact, ergonomic and lightweight instrument: size 234x99 mm and weight less than 900g.

The S7 series has Xscale Marvell processor PXA-3100 da 806 MHz with Windows Mobile 6.5 Professional OS. "

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Innovative tools for accurate geographic data field collection

Main features:

GNSS RECEIVER 120 CHANNELS
Decimetric/centimetric accurcy in real time (better accuracy achievable using external antenna)

PERFECTLY READABLE DISPLAY WITH DIRECT SUNLIGHT
Display TFT VGA 3.7" high contrast

5MP INTEGRATED CAMERA
High quality photos

3G MODEM
High-speed Internet connection in the field

LITHIUM BATTERY WITH HIGH PERFORMANCES
8 hours autonomy on full charge. Hot swappable, quick battery replacement

[1]IP65 CERTIFICATION
Fully operational, even in very adverse situations

COMPLETE COMMUNICATION SET
USB, Wireless LAN, Bluetooth 2.1, slot for SD and SIM card

STONEX S7

SYSTEM
Windows Mobile 6.5 Professional
Processor 806 MHz
256MB RAM
256MB + 4 GB (internal storage)
SDHC 4GB included - up to 16 GB (external storage)
Display: 3.7" VGA TFT LCD

GNSS
GNSS 120 canali
L1, L2, GPS, GLONASS, SBAS (S7-G)
L1, GPS, GLONASS, SBAS (S7-D)
Centimetric accuracy (S7-G)
Decimetric accuracy (S7-D)

CONNECTIVITY
Wireless LAN 802.11b/g
Bluetooth v. 2.1+EDR
3G modem
Slot Micro SDHC card
Mini USB 2.0
Slot for SIM Card

"S7-G: flexible utilization, from GIS to Topography

S7-G is a versatile and flexible instrument, capable to offer high accuracies for the demanding users, switching from GIS to topographic surveys "

GIS Systems STONEX:
Innovative tools for accurate geographic data field collection

Technical features S7 series

SYSTEM ABSTRACT

Sunlight-readable 3.7" Polarized TouchScreen	
Built-in GSM Mobile Station Modem	
Wi-Fi and Bluetooth Wireless Technology	
5 Megapixel Autofocus Camera, Windows Mobile 6.5 Professional	

BATTERY (RECHARGEABLE LITHIUM)

Battery Capacity	11.1 V × 2500 mAh
Working Hours	8 hours (normal use)

SIZE AND WEIGHT

Size	234 × 99 × 56 mm
Weight	S7 G: 895 g (battery included)
	S7 D: 850 g (battery included)

ENVIRONMENT

Humidity	5%~95% RH (non-condensing)
Operating Temperature	-20℃ to +60°C
Storage Temperature	-30℃ to +70℃
Waterproof/Dustproof	IP65

CAMERA

Static Mode	AF 5MP
Image Format	JPG (2048×1536)
Video Mode and File Format	QVGA Resolution - WMV

DISPLAY

Model	TFT colors, LED backlight
Resolution and Size	640 × 480 - 3.7" (diagonal)

CELLULAR MOBILE AND WIRELESS SYSTEM

Band	GSM/EDGE: 900/1800 MHz WCDMA/HSDPA: 900/2100 MHz
Wi-Fi	802.11 b/g
Bluetooth	Version 2.1 + EDR

MECHANICAL SHOCK

Drop Test	1.2 m on concrete

INTERFACE AND INPUT

Integrated Speaker and Microphone	
Soft Keyboard Numbers and Characters Input, SIM Socket	
External Power Supply Connector, SDHC card socket	

BUTTONS AND CONTROL

Navigation Button, Power Button, Confirm Button	
F1 - F4 (customized function buttons), Windows Button	

DATA COMMUNICATION

Voice Call and MMS, Mini Waterproof USB Connector	
802.11 b/g Wireless LAN, Built-in GPRS/GSM Comm. module	
EDGE Support, Standard Bluetooth, Voice Call and MMS	

HARDWARE

Processor	Marvell PXA-310 806 MHz Xscale CPU
RAM	256 MB
Flash Memory	256 MB + 4GB
External Storage	SDHC 4 GB included (max. 16 GB)
Operation System	Windows Mobile 6.5 Professional

INPUT/OUTPUT

NMEA 0183 Support	Available
RTCM/CMR Support	RTCM 2.1, 2.3, 3.0, 3.1, CMR, CMR+,RTCA

STANDARD ACCESSORIES

Soft Bag, Charger Adapter, USB Cable, Rear Hand-strap, Battery	
Stylus Pen with String, CD and Manual, Screen Protector	

OPTIONAL ACCESSORIES

Telescopic pole, Backpack kit for external antenna	
External antenna (GPS, GLONASS, L1-L2)	
External antenna cable (2 m or 5 m), Holder for pole, Carrying case	

SERIE	S7 D	S7 G
Receiver	120 Channels[1]	120 Channels[1]
System	GPS (L1 C/A, L1); GLONASS (L1 C/A, L1), GALILEO (E1 test), COMPASS (L1), SBAS	GPS (L1 C/A, L1, L2, L2C), GLONASS (L1 C/A, L1, L2), GALILEO (E1 test), COMPASS, SBAS
Maximum Update Rate	5Hz[2]	5Hz[2]
Initialization Time	< 10 s	< 10 s
Time to First Fix	< 50 s (Cold Start)[3]	< 50 s (Cold Start)[3]
	< 35 s (Hot Start)[4]	< 35 s (Hot Start)[4]
NMEA 0183 Support	Available	Available
RTCM/CMR Support	RTCM 2.1, 2.3, 3.0, 3.1, CMR, CMR+,RTCA	RTCM 2.1, 2.3, 3.0, 3.1, CMR, CMR+,RTCA

ACCURACY[5]	S7 D - GNSS	S7 G - GNSS
Positioning Accuracy	Sub-meter/decimeter	Centimeter
Accuracy Internal Antenna	Decimeter	RTK: horizontal 2 cm + 1 ppm; vertical 3 cm + 2 ppm
Accuracy External Antenna	Decimeter	RTK: horizontal 1 cm + 1 ppm; vertical 2 cm + 1.5 ppm
Postprocessed	< 0.5 m + 1 ppm	5 mm + 1 ppm (horizontal)
Autonomous	1.5 m RMS	1.2 m RMS
SBAS	0.6 m RMS[6]	0.6 m RMS[7]
DGPS	0.5 m RMS	0.4 m RMS

Specifications are subject to change without notice.

[1]Parallel tracking (10-channel when tracking SBAS). [2]Standard configuration for handheld use. [3]No almanac or ephemerides and no approximate position or time. [4]Almanac and recent ephemerides saved, approximate position and time entered. [5]Performance specifications subject to GPS system characteristics, ionospheric and tropospheric conditions, satellite geometry, baseline length, multipath effects and the presence of intentional or unintentional interference sources. [6]GPS only. Clock aligned to GPS system time. [7]GPS only.

Handheld receiver STONEX S4-H

STONEX S4-H is the new handheld family of STONEX. Fully integrated devices, ideal for all jobs requiring a handheld for fast survey on the field.

STRONG, RELIABLE, HIGHLY PRODUCTIVE

S4-H: designed to deliver a GPS system for fast and accurate surveys.

TO WORK UNDER ANY WEATHER CONDITION

Strong and reliable design coupled with IP65 certification guarantees S4 to face all possible environment and working conditions. The achieved Certifications and manufacturing processes emphasizes the highest efficiency and reliability for GIS users.

ADVANCED FEATURES IN ONE HAND

The embedded GPS receiver with metric accuracy at high performances, 5 megapixel camera with internal HD autofocus, modem GPRS, WiFi e Bluetooth, are only a portion of the S4H characteristics.
The TFT VGA 640x480 high brightness display, readable under direct sunlight and the replaceable high capacity lithium battery, with many hours of autonomy, add to STONEX S4H an excellent working capability on the field.

ADVANCED GPS FUNCTIONS

S4H is fully compatible with differential correction protocols RTCM2.X emitted from CORS station and GPS NW in addition to the differential correction coming from the suitable geostationary satellite systems (WAAS, EGNOS, GAGAN, MSAS); positioning accuracy can reach up to 1 m.

The receiver can be supplied with GeoGis, software developed by STONEX.

" *GPS Handheld STONEX S4H receiver is easy and handy, suitable to anybody needs a predictive and efficient data collector system on the field. Integrated 50 channels GPS with high receptiveness SBAS technology, camera at 5 MP with internal HD autofocus, modem GPRS, Wi-Fi and Bluetooth are only some of the many features that enable high performances and high productivity.* **"**

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Main features:

INTEGRATED GPS RECEIVER WITH HIGH PERFORMANCES
Position accuracy until to 1 m in real time mode at low price

PERFECTLY READABLE DISPLAY WITH DIRECT SUNLIGHT
Display TFT VGA 3.7" high contrast

5 MEGAPIXEL INTEGRATED CAMERA
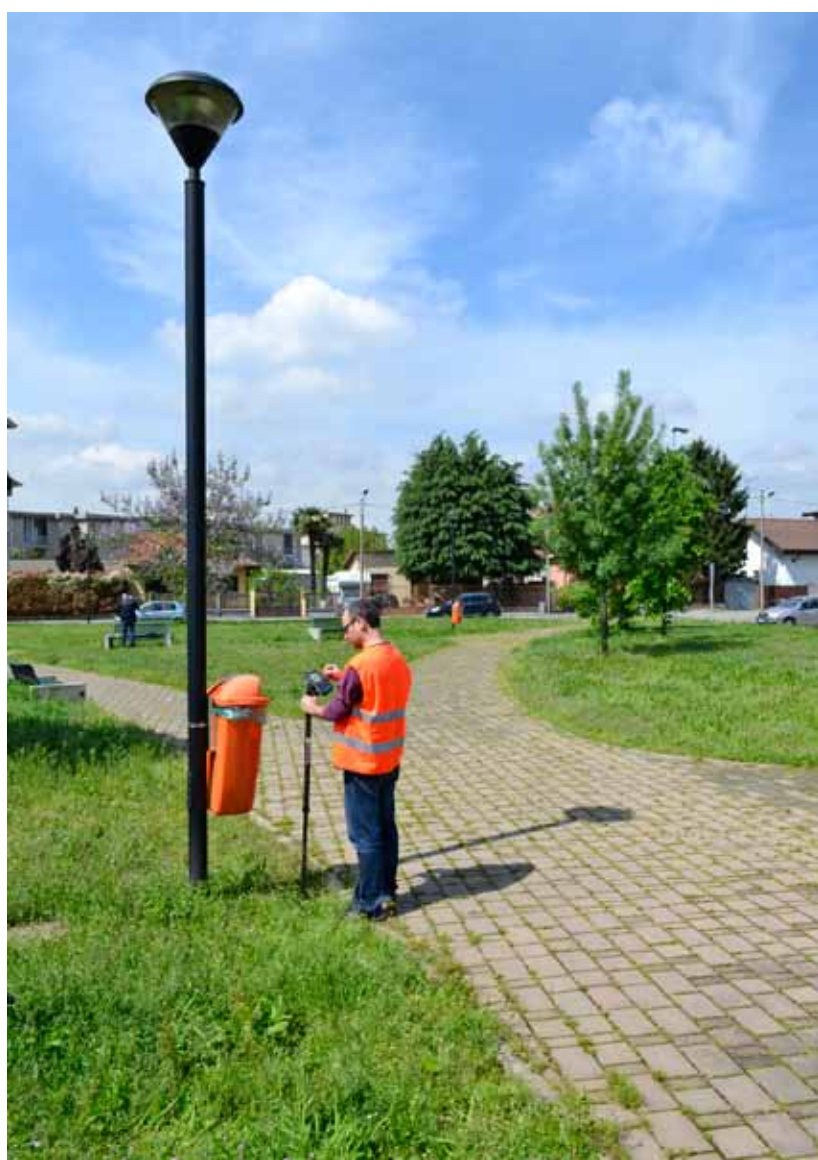High quality photos

RTCM DIFFERENTIAL CORRECTION
Positioning accuracy improved by connection to GPS net

IP65 CERTIFICATION
To work even under very difficult conditions

COMPREHENSIVE COMMUNICATION SET
USB, serial port RS232, Wireless LAN, Bluetooth 2.1 and slot SD card

STONEX S4-H

SYSTEM
Windows Mobile 6.5 Professional
Processor 806 MHz
256MB RAM
256MB + 4 GB (internal storage)
TF up to 32 GB (external storage)
Display: 3.5' QVGA TFT LCD

GPS
GPS L1 (C/A) code
SBAS
50 channels
Metric accuracy

CONNECTIVITY
Wireless LAN 802.11b/g
Bluetooth v. 2.1+EDR
Slot Micro SDHC card
Mini USB 2.0

Technical features S4-H

HARDWARE

Operation System	Windows Mobile 6.5 Professional
Processor	Marvell PXA-310 806 MHz Xscale CPU
RAM	256MB
Internal Storage	4GB+256MB
External Storage	TF extensible to 32GB
Sensor	Electronic compass (optional)

BATTERY (RECHARGEABLE LITHIUM)

Battery Capacity	7.4V, 1500mAh,11.1Wh,Li-Ion
Working Hours	Endurance up to 12 hours (2 batteries)

SIZE AND WEIGHT

Size	177 × 91 × 33 mm (L*W*D)
Weight	460g (battery included)

ENVIRONMENT

Relative Humidity	5% ~ 95% non-condensing
Operating Temperature	-20℃ to +60℃
Storage Temperature	-30℃ to +70℃
Waterproof/Dustproof	IP65

DISPLAY

Model	TFT colors, LED backlight
Resolution	480 × 640 VGA
Size	3.7 inch

DATA COMMUNICATION

USB	Mini waterproof USB Connector
Wireless	802.11b/g Wireless LAN
Bluetooth	Bluetooth version 2.1+EDR

BUTTONS AND CONTROLS

Power key, Win key, ESC key, Numeric keys , Alphabetic keys ,Symbol key, Left &Right soft key, Screen brightness control keys , Send &End key, Shift key(Shift F1 and F2, direction, tab and *#), Camera key

INTERFACE AND INPUT

Multi-media	Integrated speaker, microphone and telephone receiver, support record and replay
Soft key	Soft keyboard for numbers and symbols input
SIM card	SIM card socket
External power supply	External power connector
TF card	Micro SD card socket
Data Transfer interface	USB connector, serial port, RS232 COM port

STANDARD ACCESSORIES

Carton package, Adapter, USB cable, 2 Batteries, Handstrip , Stylus & string of pen , CD and Manual, Screen protector, Charger set

MECHANICAL SHOCK

Drop Test	1.2m onto concrete

OPTIONAL ACCESSORIES

Car charger set	

CAMERA

Static Mode	AutoFocus 5MP
Image Format	JPG (2048×1536)
Video Mode	Up to VGA resolution

DATA COMMUNICATION

Communication module	Internal quad-band global communication module
Multi-media	Voice call and multimedia message

RECEIVER SPECIFICATIONS

Chipset	U-blox6t
Receiver	Single frequency GPS receiver
Channel	50 channels
System	GPS, SBAS
Update Rate	1Hz
Cold Start	26s
GPS	L1 frequency, C/A code
SBAS	WAAS/EGNOS/MSAS/GAGAN
RTCM/CMR Support	RTCM2.1, 2.3
NMEA-0183 Support	Fully compatible with CORS and regional reference station VRS/NRS
CORS (VRS/NRS) Support	Data I/O, NMEA(GGA, GLL, RMC, GSA, GSV, VTG)
Stand Alone Accuracy	1 - 3m
RTK Accuracy	1.5m

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Innovative tools for accurate geographic data field collection

Specifications are subject to change without notice.

GeoGis: GIS for everyone

GeoGis is powerful solution for GIS mapping using Windows Mobile handheld systems.
Collecting data with GeoGis is easy and fast.

Two integrated modules compose GeoGis:
GeoGis for mapping in the field and **GeoGisOffice** for data processing in the office.

Fully conceived and developed in Italy, into STONEX R&D department, GeoGis software allows to use handhelds GNSS easily and intuitively, with capability to navigate on raster maps or vectorial layout (as ESRI® shapefile formats) and on Google® maps through the use of integrated modem, which can be also used to transfer data to the office utilizing wireless/GPRS connections.

Using GeoGis you can:

- Work everywhere thanks to the availability to choose from the main reference systems in the world and the possibility to create a new one, following the job requirements;
- Navigate on raster or vectorial maps;
- Count on an easy UI that allows to monitor all the survey aspects;
- Use an integrated working method to store points, paths, area and all the elements that compose the survey;
- Collect data with the required accuracy, thanks to the real time differential corrections (RTK/SBAS) or post processing;
- Build, evolve and manage territorial information databases, for all survey's elements;
- Insert digital pictures in order to merge with collected data, using a handheld S7 or S4H equipped with integrated camera;
- Practical and accurate research of surveyed elements, even in the most difficult environmental conditions;
- Connect external surveying devices for better completion of collected data;
- Transfer data to the office using connection wireless/GPRS.

GeoGisOffice

GeoGisOffice is a powerful and easy to use office application that allows visualizing, modifying and exporting GIS data, collected by STONEX receivers S7 and S4. GeoGisOffice allows updating maps, organizing corrected data by post processing and storing GIS information for later analysis.

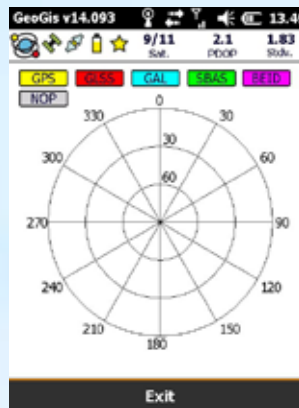It is the ultimate application for everyone needing to manage SIT data.

With GeoGisOffice is possible to insert all gathered data in a unique geographic system selected from 3389 distributed in to 142 regions. GeoGisOffice allows easily charging shape file and other GIS data bringing out updates on the field. GeoGisOffice additionally allows transforming data in several GIS formats, modifying and exporting in to file SHP, KMZ, DXF and generic ASCII table.
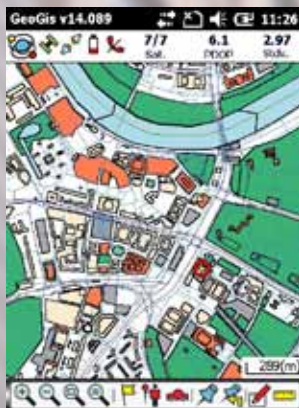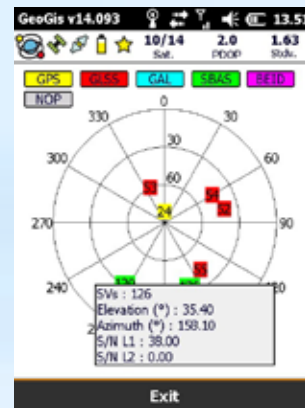
Browsing on shapefile

Navigation on raster map

Displaying satellites

Satellite's features

Data View

Point definition

Reference system selec/local

RTK connection

Background elements selection

Item search

Item search

Language choice

GeoGis: three detailed solutions

1. FORESTRY

The high-sensitivity GPS receiver along with the ease of use, allow you to work even under dense woodland coverage.
The use of STONEX GIS in forestry allows you to:

- Take a census of woods and forests;
- Take a boundary of areas inserted into forest fire danger area;
- Take a census of plant diseases.

2. AGRICULTURAL

Adapted solution for agricultural applications, with capabilities to make accurate measures of cultivation surfaces with delimitation of their boundaries.
GeoGis is an excellent instrument to:

- Field mapping and boundaries delimitation;
- Take a generic census of plants and trees;
- Check winegrowing plants, olive, valuable plantation;
- Take a census of respected trees as per current European laws;
- Design of flowerbed;
- Census, check and localization of plants and equipment of parks and gardens;
- Fast mode area computation with topographic accuracy;
- Survey of farmed plant diseases.

3. SECURITY, GOVERNANCE AND TERRITORIAL MONITORING

The compact and robust manufacture combined with software applications versatility made GeoGis STONEX handheld the best solution for public facilities planning, monitoring and up keeping.

GEOGIS APPLICATIONS' EXAMPLES:

PUBLIC AGENCIES, DRAINAGE POOLS, WATER LAW-OFFICERS, WATER/GAS MANAGEMENT AGENCIES AND SO ON

- Waste dumpsters;
- Storm drains;
- Gutters;
- Utility poles;
- Hydraulic elements;
- Wells;
- Water locks;
- Wastewater;
- Water diversions;
- Enclosures for public works;
- Mapping significant territorial elements.

CITY VIGILANCE, TRAFFIC POLICE

- Fast survey on incidents' locations;
- Fast delivery of photos and data to control center;
- Advices of occurrences on the territory and communication to central office.

INDIVIDUATIONS OF RISK AREAS

- Fast mapping of hydrological risk area;
- Fast mapping of collapses risk area.

SEA/RIVERS/LAKES

- Bathymetric instruments connection;
- Coasts' erosion check;
- Beacons positioning;
- Paths' tracking for sea localization (cables positioning).

ARCHEOLOGY

- Excavations' progress check;
- Preservation sites' boundaries;
- Significant sites' localizations.

WILDLIFE

- Take a census and check bees swarms' transfer, birds' swarms, animals' droves;
- Take a census and check of intensive animals' farming (veterinarian checks);
- Sites mapping for animals' infection risks.

TRACKING

- Pedestrian or cycling paths' mapping;
- Natural or artificial rest and refreshment areas' mapping.

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Stonex GIS Processor

STONEX Gis Processor is a SW application made by STONEX, in collaboration with the "Politecnico di Torino" for raw data post-processing, delivered by STONEX GIS instruments.
GIS data post processing foresees the use the GPS and GLONASS code and carrier raw data, phase L1/L2, by smoothing procedures (L2 only for S7G). These instruments during survey in the field produce files in *.plf format, including raw data. Post processing use Rinex files generated by a base station of an existing network or autonomously produced by the user.

Main software functions are:

- Operating procedures set up;
- Weights' allocation the (signals' noise, satellites' elevation);
- Phase smoothing parameters' preparation following common literature recognized methodologies (Geometry free float or code by L1);
- Rough errors recognition of (data snooping);
- Troposphere and ionosphere's corrections following common literature documented methodologies (Saastmoinen or Hopfield);
- Results calculation and presentation through dedicated reports (like tables, graphics design or Word report)

Achieved results are exportable in several formats: .xls, .csv, .txt. The corrections are carried out into WGS84 coordinates, and results are exportable into cartesian coordinates in the desired reference system.
Additional GeoGisOffice's graphic processing are foreseen.

STONEX GIS Processor can be used in conjunction with GeoGisOffice or as standalone program.
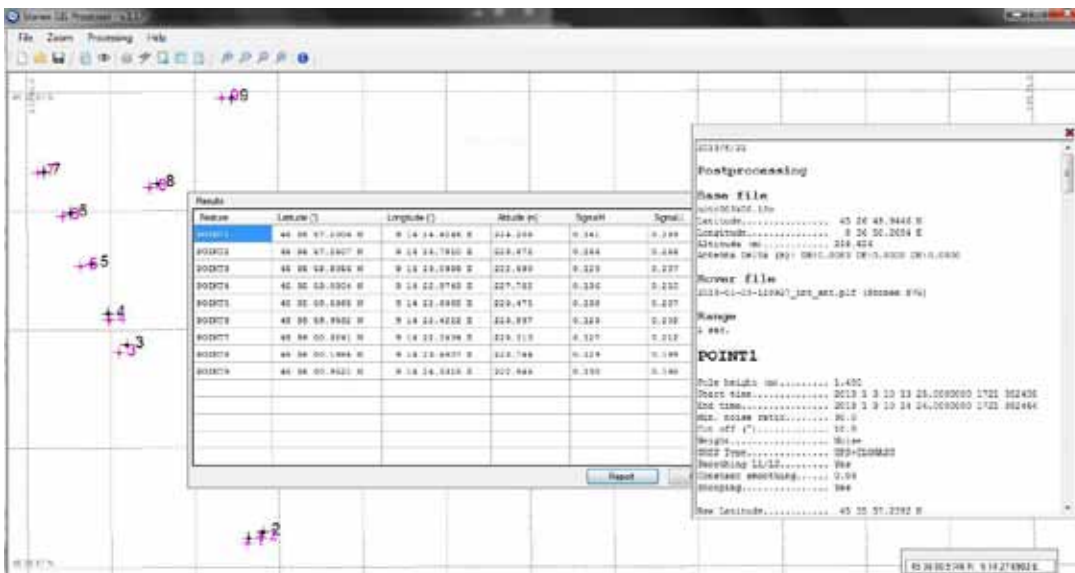

Stonex Pocket Mobile

This SW application is intended to control STONEX handhelds S4 and S7 series. It allows the output of GPS measures in NMEA protocol through serial ports to external devices or on virtual ports for third party SW applications installed on the same handheld. Differential correction can be reached through GPS NW connection or external radio modem. The standard version of PocketMobile is free and is included in the handheld. A full version, allowing to use the instrument as a base station, is available for purchase.

Check of output and virtual serial ports settings
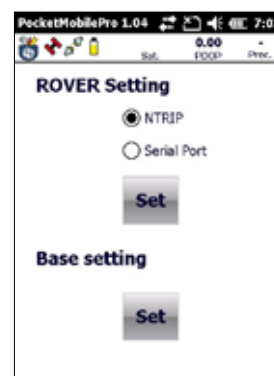
Rover or Base settings
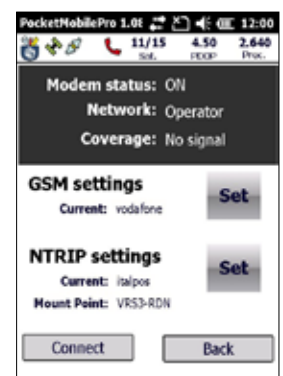
Connection for differential correction

About us

STONEX® srl is a multinational company, based in Italy, designing and manufacturing high precision surveying instruments for different applications: civil engineering, topography, GIS & Mapping, 3D Imaging, security, transportation and mining.
The company runs operations worldwide (today Stonex branded products are used in more than 80 countries) through a high skilled network of distributors and dealers.

Stonex product range includes:

- Total Stations
- GNSS/GPS receivers
- Topographic GNSS receivers
- GPS /GNSS handheld receivers for GIS & Mapping
- CORS GNSS receivers for GPS networks and tracking systems
- Laser Scanners
- Softwares for GIS, topography and 3D scanning

Stonex is always characterized by its high standards of quality, accuracy and reliability.
Stonex is certified UNI EN ISO 9001:2008